

WHAT IS CLAIMED IS:

1. For use with network systems that employ packets having  
2 an associated priority, a head of line blockage avoidance system,  
3 comprising:

4 m inputs, m numbering at least two, configured to receive said  
5 packets;

6 n packet first-in-first-out buffers (FIFOs), n numbering at  
7 least two, each of said packet FIFOs configured to receive at least  
8 one of said packets from said m inputs;

9 a priority summarizer configured to generate a priority  
10 summary of said packets within said m inputs and said n packet  
11 FIFOs; and

12 a scheduler configured to cause one of said n packet FIFOs to  
13 be queued for processing based on said priority summary.

2. The head of line blockage avoidance system as recited in  
3 Claim 1 wherein said priority summary indicates which of said n  
4 packet FIFOs contains a packet having the highest priority or is to  
5 receive said packet having the highest priority from one of said m  
inputs.

3. The head of line blockage avoidance system as recited in  
2 Claim 2 wherein said priority summary further indicates an order in  
3 which to transmit said at least one of said packets contained  
4 within said n packet FIFOs to a destination FIFO based upon packet  
5 priority.

4. The head of line blockage avoidance system as recited in  
2 Claim 1 wherein each of said m inputs includes a source FIFO  
3 configured to contain at least one of said packets.

5. The head of line blockage avoidance system as recited in  
2 Claim 4 wherein said priority summarizer is further configured to  
3 generate said priority summary of said packets within each of said  
4 n packet FIFOs and said packets within said source FIFO of each of  
5 said m inputs that are to be transferred to said each of said n  
6 packet FIFOs.

6. The head of line blockage avoidance system as recited in  
2 Claim 1 further comprises a destination FIFO and an output, said  
3 destination FIFO interposing said n packet FIFOs and said output,  
4 said scheduler further configured to transfer at least one of said  
5 packets from said one of said n packet FIFOs toward said  
6 destination FIFO for transmission via said output.

7. The head of line blockage avoidance system as recited in  
2 Claim 1 wherein said scheduler is further configured to assign said  
3 associated priority to each of said packets based on a priority  
4 associated with each of said m inputs or a destination.

8. For use with network systems that employ packets having  
2 an associated priority, a method of operating a head of line  
3 blockage avoidance system, comprising:

4 employing  $m$  inputs,  $m$  numbering at least two, configured to  
5 receive said packets;

6 employing  $n$  packet first-in-first-out buffers (FIFOs),  $n$   
7 numbering at least three, each of said packet FIFOs configured to  
8 receive at least one of said packets from said  $m$  inputs;

9 generating a priority summary of said packets within said  $m$   
10 inputs and said  $n$  packet FIFOs; and

11 scheduling a one of said  $n$  packet FIFOs to be processed based  
12 on said priority summary.

9. The method as recited in Claim 8 wherein said priority  
2 summary indicates which of said  $n$  packet FIFOs contains a packet  
3 having the highest priority or is to receive said packet having the  
4 highest priority from one of said  $m$  inputs.

10. The method as recited in Claim 9 wherein said priority  
2 summary further indicates an order in which to transmit said at  
3 least one of said packets contained within said  $n$  packet FIFOs to  
4 a destination FIFO based upon packet priority.

11. The method as recited in Claim 8 wherein each of said m  
2 inputs includes a source FIFO configured to contain at least one of  
3 said packets.

12. The method as recited in Claim 11 wherein said generating  
2 further comprises generating said priority summary of said packets  
3 within each of said n packet FIFOs and said packets within said  
4 source FIFO of each of said m inputs that are to be transferred to  
5 said each of said n packet FIFOs.

13. The method as recited in Claim 8 further comprising  
2 employing a destination FIFO and an output, said destination FIFO  
3 interposing said n packet FIFOs and said output, said scheduling  
4 further comprises transferring at least one of said packets from  
5 said one of said n packet FIFOs toward said destination FIFO for  
6 transmission via said output.

14. The method as recited in Claim 8 wherein said scheduling  
2 further comprises assigning said associated priority to each of  
3 said packets based on a priority associated with each of said m  
4 inputs or a destination.

15. A crossbar head of line blockage avoidance system that  
2 employs packets having an associated priority, comprising:

3       m physical interfaces, m numbering at least two;

4       m inputs, each of said inputs coupled to corresponding ones of  
5       said m physical interfaces to receive said packets;

6       m outputs that transmit said packet to corresponding ones of  
7       said m physical interfaces, each of said outputs having:

8               n packet first-in-first-out buffers (FIFOs), n numbering  
9               at least m, each of said packet FIFOs receives at least one of  
10          said packets from said m inputs, and

11          a destination FIFO interposing said n packet FIFOs and  
12          said output;

13          a priority summarizer that generates a priority summary of  
14          said packets within said m inputs and said n packet FIFOs within  
15          each of said m outputs; and

16          a scheduler that causes one of said n packet FIFOs for each of  
17          said m outputs to be queued for processing based on said priority  
18          summary.

16. The crossbar head of line blockage avoidance system as  
2 recited in Claim 15 wherein said priority summary indicates which  
3 of said n packet FIFOs for each of said m outputs contains a packet  
4 having the highest priority or is to receive said packet having the  
5 highest priority from one of said m inputs.

17. The crossbar head of line blockage avoidance system as  
2 recited in Claim 16 wherein said priority summary further indicates  
3 an order in which to process said  $n$  packet FIFOs for each of said  
4  $m$  outputs based upon packet priority.

18. The crossbar head of line blockage avoidance system as  
2 recited in Claim 15 wherein each of said  $m$  inputs includes a source  
3 FIFO configured to contain at least one of said packets.

19. The crossbar head of line blockage avoidance system as  
2 recited in Claim 18 wherein said priority summarizer generates said  
3 priority summary of said packets within each of said  $n$  packet FIFOs  
4 and said packets within said source FIFO of each of said  $m$  inputs  
5 that are to be transferred to said each of said  $n$  packet FIFOs.

20. The crossbar head of line blockage avoidance system as  
2 recited in Claim 15 wherein said scheduler causes to transfer at  
3 least one of said packets from said one of said  $n$  packet FIFOs  
4 toward said destination FIFO for transmission via said output for  
5 each of said  $m$  outputs.